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# THE BUSINESS OF TEN DAIRY FARMS IN THE BLUEGRASS REGION OF KENTUCKY.

By J. H. Arnold, *Agriculturist.*

CONTENTS.

| | Page. | | Page. |
|---|---|---|---|
| General description of the region from the point of view of dairying | 1 | Seven successful dairy farms analyzed and compared | 6 |
| Receipts from dairy products, together with labor incomes, on each of 10 farms | 2 | The farms that failed | 10 |
| Other sources of income | 3 | Comparison of the 7 more successful dairy farms with the average of 10 | 11 |
| Cost of feed | 4 | | |
| To what extent dairying may be developed in the bluegrass region | 4 | | |

The purpose of this bulletin is to present a brief analysis of the business of 10 dairy farms which were found among 187 farms [1] selected and studied during 1914 in Mason, Scott, and Madison Counties, in the bluegrass region of Kentucky. This analysis will show how these farms were organized and will point out the factors which made some of them profitable. From so few records it would not be possible to analyze thoroughly the economic situation relative to dairying in this locality, but the analysis should be of some practical interest to the bluegrass farmer who already is running a dairy farm or who is about to organize one.

## GENERAL DESCRIPTION OF THE REGION FROM THE POINT OF VIEW OF DAIRYING.

The fact that this locality is famous for bluegrass would suggest a favorable locality for dairying. The adaptation of the soil to bluegrass pasture is the distinctive natural advantage which this locality has for this type of farming. The climatic factors, however, partly

[1] An analysis of these farms, including the 10 dairy farms, is given in U. S. Department of Agriculture Bulletin No. 482, Farming in the Bluegrass Region.

offset this advantage, especially for the production of cheese and butter. The long summer months are warm, with a lower rainfall than the winter months, while in the extensive dairy sections of Wisconsin and New York the highest rainfall is during the summer months, which average 7 to 8 degrees cooler than in Kentucky. These adverse conditions have not interfered with the increased production of market milk where there is a demand at good prices, but they are a handicap especially in the production of cheese, which is produced to best advantage in a climate that is relatively cool.

Most of the dairy farms in the region have developed near such large cities as Cincinnati and Louisville, where large quantities of milk and cream may be marketed. Lexington, a city of about 40,000 inhabitants, and several other towns of 5,000 to 15,000, furnish a market for a few dairy farms in the central part of the bluegrass region.

## RECEIPTS FROM DAIRY PRODUCTS, TOGETHER WITH LABOR INCOMES, ON EACH OF TEN FARMS.

The business of each of the 10 farms studied may be summarized briefly, as follows:

TABLE I.—*Size of farms, with number of cows and with receipts from labor income and dairy products.*

| Farm No. | Size of farm. | Number of cows. | Labor income. | Gross receipts from milk. | Receipts from cream. | Receipts from butter. | Gross receipts per cow. |
|---|---|---|---|---|---|---|---|
| 1 | 400 | 75 | $1,466 | $5,315 | $2,101 | ..... | $98.88 |
| 2 | 290 | 30 | 3,654 | 4,500 | ..... | ..... | 150.00 |
| 3 | 247 | 19 | 1,739 | 3,066 | 730 | ..... | 199.78 |
| 4 | 150 | 50 | 6,408 | 6,768 | 1,128 | $25 | 158.00 |
| 5 | 51 | 15 | 3,201 | 2,920 | 225 | 260 | 227.00 |
| 6 | 86 | 9 | 1,121 | 76 | 1,996 | ..... | 230.00 |
| 7 | 82 | 30 | 1,509 | 2,966 | 480 | ..... | 114.86 |
| 8 | 70 | 4 | [1] 0 | ..... | 208 | ..... | 52.00 |
| 9 | 134 | 12 | 287 | ..... | 624 | ..... | 52.00 |
| 10 | 120 | 12 | [2] 0 | ..... | 104 | 780 | 73.60 |
| Average of all | 163 | 27 | 1,773 | 2,561 | 689 | 106 | 126.16 |

[1] This farm fell $139 short of paying expenses, including interest on investment.
[2] This farm fell $1,521 short of paying expenses, including interest on investment.

Thus it will be seen that these ten dairy farms depend mostly on market milk for income. Cream is next in importance. Very little butter is marketed. The one dairyman depending mostly on butter for income failed to make expenses, counting interest on investment among the expenses. The market price of milk distributed to customers ranged from 7 to 10 cents per quart, and cream 60 cents to $1 per gallon, depending on market opportunities and quality of

product. Near the smaller towns the milk is mostly bottled and is marketed at the door of the customer. In the vicinity of larger cities it is mostly shipped in and retailed through local distributors. When this was done the farmer received 15 to 20 cents per gallon for milk and paid 1½ to 2 cents per gallon to ship it 30 to 50 miles.

The labor incomes [1] on most of the farms were large, as compared with those of successful farms of other types in this region. The average labor income on 187 farms was $750, while the average of these ten dairy farms was $1,773.

Table I shows plainly that of the ten farms studied those which sold market milk and which had high net receipts per cow made the most money.

## OTHER SOURCES OF INCOME.

While dairy products furnished the main source of income on these farms, the farmers found it profitable to diversify to some extent. Other common sources of income were tobacco and wheat. In some cases a few steers were kept. There was some income from the sale of dairy cows, young stock, and calves. In some cases also there was a substantial income from swine and poultry. The percentage receipts from dairy products and tobacco on these farms were as follows:

TABLE II.—*Percentage receipts from dairy products and tobacco.*

| Farm No. | Receipts from dairy. | Receipts from tobacco. | Farm No. | Receipts from dairy. | Receipts from tobacco. |
|---|---|---|---|---|---|
| | *Per cent.* | *Per cent.* | | *Per cent.* | *Per cent.* |
| 1 | 80 | 10 | 7 | 90 | 0 |
| 2 | 67 | 13 | 8 | 55 | 0 |
| 3 | 82 | 2 | 9 | 49 | 15 |
| 4 | 72 | 0 | 10 | 51 | 0 |
| 5 | 85 | 9 | | | |
| 6 | 80 | 9 | Average | 71 | 5.8 |

Tobacco is a crop specially adapted to the region, and on many farms it is the main source of income. The percentage receipts from dairying on the ten farms in question, as shown in Table II, included net receipts from dairy stock and from calves. During the past two years (1915 and 1916) Farm No. 4 has found hemp a profitable crop, not only because of recent increase in price of this product, but because during its growing season hemp requires no attention, while the harvesting is done in a few days by machinery and the other operations in preparation for marketing may be let out to negroes who are experienced hemp workers.

[1] Labor income is what the farmer makes above expenses, which include current interest on the money he has tied up in his business.

## COST OF FEED.

As previously suggested, the adaptation of soil to bluegrass grazing is a distinct advantage for the dairy business in this section. During the grazing period, from May to November, most of these dairymen have not fed concentrates, except when the season happened to be drier than usual and the pasture short. Milk usually is reduced in price during the summer because of the plentifulness of grazing, which increases the general supply of milk. Cows graze to a considerable extent on bluegrass during the winter months, and occasionally on rye or wheat fields. Thus the quantity of feed that needs to be bought is small, compared with that bought on the Northern dairy farm. On account of recent advance in price of concentrated feeds, one of the ten dairymen has filled his old silo with clover and has built a new one for corn and cane silage. Clover is thus used as a substitute for the more expensive concentrated feeds, such as cottonseed meal, bran, and shorts. In 1914, the year the business records of these farms were taken, the average cost of concentrated feeds bought was about $14 per cow, which in terms of concentrated feed at $35 per ton (about the average price in 1914) would mean that the average cow got about 4.4 pounds of this feed daily for 180 days. Other purchased feeds, mostly hay and corn fodder, amounted on the average to about $4.50 per cow.

The bluegrass dairyman pastures more intensively than the average live-stock farmer. The latter allows about 4 acres for each animal unit,[1] while the average for the ten dairy farms was found to be about 1.6 acres for each animal unit on the farm. Dairy farms are relatively small, the manure is exceptionally rich in plant food, and a large part of it is scattered on the pastures. According to figures obtained, $40 to $50 would be a liberal estimate for the average cost of feed for each dairy cow kept on the farms studied.

## TO WHAT EXTENT DAIRYING MAY BE DEVELOPED IN THE BLUEGRASS REGION.

While a study of these ten dairy farms would indicate that market milk production was profitable where markets have developed, dairy farming is not the type that can be as generally recommended as some other types until it has been demonstrated that butter and cheese, the least perishable of dairy products, and those which have a wide demand in the general market, can be profitably produced here. The production of milk and butter in the three counties (Madison, Scott, and Mason) in which these ten dairy farms are located remained practically stationary between 1890 and 1910. On

[1] Animal unit—the equivalent of 1 cow, horse, or beef animal. Two heifers, 4 calves, 7 sheep, 5 hogs, 14 pigs, or 100 chickens are counted as equivalent to an animal unit.

the other hand, the production of tobacco, hemp, hay, beef cattle, and sheep, characteristic of the more general profitable types, had a marked increase during the same period. In 1890 the census enumerators found 5,357 pounds of cheese produced in Madison County and 2,025 pounds in Mason County. In the census years of 1900 and 1910, practically none was reported for these counties. In Jefferson County, bordering on the bluegrass region, 10,120 pounds was reported in 1890 and 13,817 pounds in 1900. None, however, was reported in the census of 1910. Three counties bordering Jefferson produced about 15,000 pounds during the period covered by the census of 1890 and 1900, but none was reported for these counties in 1910. Between 1900 and 1910, however, there was a large increase in the production of market milk for the Louisville market in these counties. The cheese production that still persists in Kentucky is confined largely to the low mountains and hills bordering the bluegrass region, known as "The Rim," where there is some bluegrass land, though rather unfavorable for general farming and low in price. In this region spring water is abundant and the climate is somewhat cooler than in the more level bluegrass country. On the hilly, cheaper land along the Ohio River a small quantity of cheese was still being produced in 1910.

These facts relative to dairying in Kentucky emphasize the truth that farm enterprises once started in a locality will develop only to the extent that they find a favorable environment and are found to be profitable by practical farmers. The production of butter and cheese would no doubt be profitable in the bluegrass region and possibly at the present time would be a thriving industry if other enterprises such as tobacco, hemp, wheat, beef cattle, swine, and sheep had not proved to be more generally profitable. The fact, however, that the production of butter and cheese has not yet developed into a profitable and extensive business here is not conclusive evidence that it would not be profitable on many farms favorably situated for these enterprises. Even on many general diversified farms in this region profits could be increased by keeping better dairy cows and producing butter and even some cheese as a side line. Many farms in the bluegrass region have excellent springs which may be used to advantage in connection with such enterprises.

An important factor in retarding the development of the dairy industry even under favorable conditions is the general reluctance of bluegrass farmers to engage in it. While negro laborers as a rule are experts in growing and handling tobacco, they are not familiar with the processes of dairying and share the common objection to it. In some sections, however, where dairying has become profitable and where it has been practiced a long time, this dislike is being gradually overcome.

## SEVEN SUCCESSFUL DAIRY FARMS ANALYZED AND COMPARED.

FARM NO. 1.

| | |
|---|---|
| Size of farm.....acres.. | 400 |
| Number of cows | 75 |
| Number of other animal units [1] | 37 |
| Total capital [2] | $50,097 |
| Working capital [3] | 7,874 |
| Total receipts | 11,824 |
| Receipts from dairy | 7,416 |
| Expenses [4] | 7,854 |
| Farm income [5] | 3,970 |
| Labor income [6] | 1,466 |

This is the largest farm of the ten in question and is valued at $125 per acre. It is well situated near a market point. While it is somewhat rolling, the soil is of good quality and about all of it tillable. If properly organized, this farm should have made the largest labor income of the group. Instead, it is among the lowest, those which were only fairly successful. In the first place, the dairy business shows up poor in quality, receipts per cow being low as compared with those of the more successful farms. The operator has 75 cows, about as many as he can give proper attention to. Half his acreage easily could be made to support this herd. Thus, this area of land (400 acres) might be supporting two successful dairy farms instead of one (see farm No. 4). If there were an additional farm superintendent, however, the farm might be so organized that the dairy business could be conducted as one department, while the greater part of the land could be cropped in accordance with the best practice in the section. With a higher degree of diversity and by handling other live stock, the gross income of this farm, even with its present management, should be increased considerably without much more expense. The average expenses of the ten farms are about 45 per cent of receipts, while on this farm they are about 75 per cent, showing that the business was too expensive for the income received. This farmer housed his cows in a $7,000 dairy barn, an investment of nearly $100 per cow, while his nearest competitor, one of the most successful farmers of the group, had but one-third of this amount invested. Although this was a large farm and showed a relatively small proportion of its receipts from other sources than dairying, it failed to produce as much feed for dairy stock as the average farm ($18) and expended for purchased feeds $20 per cow.

[1] See footnote, p. 4.

[2] Total capital includes investment in land, buildings, machinery, live stock, feed, supplies, and cash to run the business.

[3] Working capital includes all items of capital except land, buildings, and other improvements usually included in real estate.

[4] Expenses include a charge for unpaid family labor, depreciation, and 5 per cent interest on total capital besides money actually paid out in conducting the farm business.

[5] Farm income is the total receipts less expenses.

[6] Labor income is farm income less 5 per cent interest on invested capital.

FARM NO. 2.

| | |
|---|---|
| Size of farm.....acres.. | 290 |
| Number of cows | 30 |
| Number of other animal units | 28 |
| Total capital | $26,890 |
| Working capital | 6,881 |
| Total receipts | 8,383 |
| Receipts from dairy | 4,500 |
| Expenses | 3,385 |
| Farm income | 4,998 |
| Labor income | 3,654 |

Of the larger sized farms among the ten studied this one is the most efficiently organized. The diversity is much greater than that of farm No. 1. About 46 per cent of receipts were from sources other than dairying, mainly wheat and tobacco. Sales of live stock amounted to $1,200 above purchases. The operator owned 132 acres and rented 158 additional, for which he paid $800 a year. All the feed except concentrates was raised on the farm. Only one man was hired, the operator and his family doing most of the dairy work. The manure from the dairy was applied to his own land. This made his crop yields much higher than the average. Eleven acres of tobacco and 10 acres of corn were raised by a cropper. Thirty-three acres of corn for grain, 12 acres of silage corn, 50 acres of wheat, 25 acres of meadow hay, and 5 acres of tobacco were raised by his own and hired labor. The owner had been in the dairy business about 40 years and is about 60 years of age. A large family had been raised and educated.

FARM NO. 3.

| | |
|---|---|
| Size of farm.....acres.. | 247 |
| Number of cows | 19 |
| Number of other animal units | 16 |
| Total capital | $15,396 |
| Working capital | 3,046 |
| Total receipts | 5,105 |
| Receipts from dairy | 3,796 |
| Expenses | 4,438 |
| Farm income | 2,509 |
| Labor income | 1,739 |

This farm had 10 acres of corn for grain, 8 acres for silage, 10 acres in rye which was grazed, and 20 acres in hay. There were 153 acres in pasture, 2 acres in garden and orchard, and the remainder, 44 acres, was considered waste land. The topography was hilly and not well adapted to cultivated crops. The land was valued at $40 per acre, though the more level land in the community was valued at $100 to $150 per acre. Three year-hands were employed on this farm and seven head of work stock were kept. Both man-labor and horse-labor were poorly utilized. A better utilization could have been achieved and the income considerably increased if a few acres of

tobacco had been raised. There were no receipts from crops and diversity was low.

FARM NO. 4.

| | |
|---|---|
| Size of farm.....acres.. | 150 |
| Number of cows | 50 |
| Number of other animal units | 48 |
| Total capital | $33,081 |
| Working capital | 11,354 |
| Total receipts | 12,500 |
| Receipts from dairy | 7,921 |
| Expenses | 2,818 |
| Farm income | 8,062 |
| Labor income | 6,408 |

This farm well may be classed as the best dairy farm of the ten. While the receipts per cow were considerably above the average, others had higher receipts per cow, but in the expenses this farm showed high efficiency in the economy of labor and feed, two most important factors in expenses. Operating expenses were only about 35 per cent of receipts, as compared with 45 per cent, the average for the ten farms. The land area (150 acres) was small as compared with the number of stock units kept on the farm. These number about 98, or about 1.9 acres for each animal unit. Of this number of animal units, 50 were dairy cows. Every part of the farm, including pasture area, received frequent applications of stable manure. There is practically no waste land on this farm. But a small acreage is occupied by fences, buildings, and roadway. Bluegrass grows even in small lots and about the buildings. The feed purchased amounted to about $10 per cow. About 50 per cent of the farm area is in bluegrass pasture, which in a normal season furnishes all the feed for dairy stock during the summer. A considerable amount of grazing also is done during the winter. Fields that are to be pastured in winter are allowed to accumulate a good growth of grass in the fall. About $1,000 of the total receipts represented breeding fees. Usually a few acres of tobacco are raised. During the last two years (1915–1916), however, hemp has been substituted for tobacco. It was estimated that the hemp for 1916 would yield about 1,700 pounds per acre, which, at 10 cents per pound (about the price of the previous year), would be $170 per acre. The expense of growing an acre of hemp is about the same as that of tobacco ($50 to $60, exclusive of rent), and the average rent for the land is figured at $30 to $50 per acre.

This farm has been organized as a dairy farm for about 12 years and has been exceptionally successful. It sets the standard for quality and prices for milk in the locality and is rated among the best dairy farms in the State. The operator is a graduate of an agricultural college. He does the work of milking, bottling, and distributing with the help of a man and a boy.

FARM NO. 5.

| | |
|---|---|
| Size of farm.....acres.. | 51 |
| Number of cows | 15 |
| Number of other animal units | 11 |
| Total capital | $8,843 |
| Working capital | 2,786 |
| Total receipts | 5,449 |
| Receipts from dairy | 3,405 |
| Expenses | 1,811 |
| Farm income | 3,638 |
| Labor income | 3,196 |

This farm shows the possibility of profitable dairying on a small farm with a small amount of capital invested, and on which about all the labor is done by the operator and his family. Here, again, high business efficiency was shown in that operating expenses were but 33 per cent of receipts and the labor income was among the highest of the group. This farmer has to buy more than the usual quantity of feed, which cost him about $25 per cow. The receipts per cow were unusually high. This was due, no doubt, to high quality of cows kept and to the fact that he milked the cows himself. The milk was retailed at 8 to 10 cents per quart and the cream at $1 per gallon. This farmer raised 3½ acres of tobacco, which he sold for about $500. He sold 5 cows for $55 per head and bought better ones for $65 per head. Sales from poultry were $80, and a colt was raised which increased in value $115. This farmer has been a farm laborer 7 years, a tenant 10 years, and an owner 8 years. He is now 40 years old. He owns 40 acres and rents 11 acres additional for hay. Twenty-five acres were devoted to permanent bluegrass pasture; the remainder, besides 2 acres counted as waste, were in crops.

FARM NO. 6.

| | |
|---|---|
| Size of farm.....acres.. | 86 |
| Number of cows | 9 |
| Number of other animal units | 33 |
| Total capital | $16,800 |
| Working capital | 2,675 |
| Total receipts | 2,982 |
| Receipts from dairy | 2,072 |
| Expenses | 1,021 |
| Farm income | 1,961 |
| Labor income | 1,121 |

This farm was only moderately successful. Profits could have been increased greatly if the business had been made larger by increasing the income from cows. If the operator had hired a man he could have increased his herd to 20 or 25 cows and besides could have raised 5 to 6 acres of tobacco instead of 2. There were no receipts from hogs, although there must have been a large quantity of skim milk which should have been fed on the farm. Only $75 worth of

skim milk was sold, showing that much of it must have gone practically to waste.

FARM NO. 7.

| | |
|---|---|
| Size of farm.....acres.. | 82 |
| Number of cows..... | 30 |
| Number of other animal units..... | 30 |
| Total capital, owner and tenant..... | $13,661 |
| Working capital, owner and tenant..... | 3,396 |
| Tenant's capital..... | 1,698 |
| Total receipts..... | 5,134 |
| Receipts from dairy..... | 3,446 |
| Expenses..... | 2,032 |
| Farm income, owner and tenant..... | 3,102 |
| Tenant's farm income..... | 1,594 |
| Tenant's labor income..... | 1,509 |
| Owner's profit on investment.....per cent.. | 12.6 |

This farm was operated by a tenant who had a half interest in the working capital of the farm, which included the investment in machinery, live stock, feed, and supplies, and cash to run the business. Business expenses were shared equally, as were also receipts. The tenant with the help of two year-hands and some extra labor performed the work. There were three work horses. Forty-five acres of the farm were in corn for silage, 33 acres in pasture, 2 acres waste, and 1 acre for garden. Receipts from other sources than dairy cows were mainly from young stock. There were no receipts from crops.

## THE FARMS THAT FAILED.

The three unprofitable farms of the ten were inefficiently organized and operated. Apparently these farmers depended mainly on dairy products for an income; but as they did not stock their farms with enough cows to make it worth while to spend their time at dairying, there could be no other result than failure. This is strikingly true of farm No. 8, which could not be classed as a dairy farm except on the ground that the four cows kept were the main source of income. These farms kept no regular hired laborers and a very small amount of extra labor was hired.

About the only comment that can be made upon these farms is that the operators were wasting their opportunities. They had fair-sized farms, but each was operating a small-sized business. The quality of the cows was poor, as shown by receipts, and no doubt much of the milk was wasted. The usual bluegrass farm in this section keeps from two to eight cows to supply milk to the family and laborers. It does not pay a farmer to give special attention to the dairy business unless there are a sufficient number of cows to warrant special equipment and the application of most of his time. He must develop and maintain a profitable market. If cream or

butter is sold, the skim milk and buttermilk, if not sold, should be utilized profitably by feeding it to hogs.

### COMPARISON OF THE SEVEN MORE SUCCESSFUL DAIRY FARMS WITH THE AVERAGE OF TEN.

It may be helpful to compare the average of the seven successful dairy farms with the average of the whole group of ten, with respect to the more essential factors, as shown below:

| | Average of ten farms. | Average of the seven successful farms. |
|---|---|---|
| *Distribution of crops:* | | |
| Average size of farm.....acres.. | 163 | 187 |
| In crops.....do.... | 66 | 70 |
| In pasture.....do.... | 76 | 100 |
| In corn for grain.....do.... | 15 | 10 |
| In corn for silage.....do.... | 13 | 16 |
| In wheat.....do.... | 13 | 15 |
| In meadow.....do.... | 16 | 20 |
| In tobacco.....do.... | 5 | 6 |
| In miscellaneous.....do.... | 4 | 3 |
| *Distribution of live stock:* | | |
| Dairy cows.....number.. | 27 | 40 |
| Young stock.....do.... | 21 | 16 |
| Swine.....do.... | 29 | 25 |
| Poultry.....do.... | 184 | 183 |
| *Distribution of capital:* | | |
| Total capital invested..... | $22,552 | $23,622 |
| Total working capital..... | 4,764 | 5,286 |
| Machinery..... | 711 | 771 |
| Investment in live stock..... | 3,291 | 3,699 |
| Cash to run farm..... | 405 | 420 |
| Feed and supplies..... | 355 | 366 |
| *Distribution of receipts:* | | |
| Live-stock products..... | 3,554 | 4,610 |
| Live-stock inventory and sales..... | 1,048 | 1,035 |
| Crop receipts..... | 589 | 813 |
| Miscellaneous..... | 120 | 235 |
| Total..... | 5,301 | 6,693 |
| *Profits:* | | |
| Receipts per cow..... | 126 | 164 |
| Average farm income..... | 3,149 | 4,266 |
| Average labor income..... | 1,773 | 2,954 |
| Per cent net earnings on investment [1]..... | 10 | 14 |

[1] Per cent net earnings is obtained by dividing the farm income (less the value of operator's labor and management) by the total farm investment. The average of operator's labor and management on the ten farms as estimated by the farmer was $766; on the seven most successful, $866.

These comparisons illustrate many of the points discussed in the foregoing pages relative to the successful dairy farms. For instance, the average successful farm had the largest business, as shown by the

size of farm, the number of dairy cows, and the working capital. On the average successful farm there were more receipts from crops and miscellaneous sources than were shown for the average of the ten farms. This indicates the greater degree of diversity on the successful farms. The most important comparison is that shown for the receipts per cow. It will be noticed that the average successful farm had much higher receipts per cow—$164, as compared with $126 on the average of the ten.

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